Contents

Preface vii
Dedication viii

Calculation of radiation-induced creep and stress relaxation, *J. Nagakawa* 1
Correlation between void swelling and SIPA creep, *C.H. Woo* 8
The effect of swelling on SIPA irradiation creep, *V.A. Borodin* 15
Critical parameters controlling irradiation swelling in beryllium, *V.I. Dubinko and V.R. Barabash* 22
Theory of irradiation swelling in materials with elastic and diffusional anisotropy, *V.I. Dubinko* 26
The effect of internal stress fields on fracture of structural materials under irradiation, *V.M. Manichev and V.A. Borodin* 33
Interstitial cluster formation in metals under intense irradiation, *E.A. Koptelov, S. Ishino, S. Iwata and N. Sekimura* 38
Post-irradiation deformation characteristics of heavy-ion irradiated 304L SS, *J.I. Cole and S.M. Bruemmer* 53
Threshold helium concentration required to initiate cracking during welding of irradiated stainless steel, *C.A. Wang, M.L. Grossbeck and B.A. Chin* 59
Welding irradiated stainless steel, *W.R. Kanne, Jr., G.T. Chandler, D.Z. Nelson and E.A. Franco-Ferreira* . . 69
The influence of silicon and phosphorus additions on neutron induced microstructural evolution of Fe–Cr–Ni ternary alloys at 646–703 K, *H. Watanabe, F.A. Garner, T. Muroga and N. Yoshida* 76
Radiation-enhanced diffusion in nickel–10.6% chromium alloys, *M. Gieb, J. Heieck and W. Schüle* . 85
Dependence of radiation-induced segregation on dose, temperature and alloy composition in austenitic alloys, *D.L. Damcott, T.R. Allen and G.S. Was* . . . 97
A model for radiation-induced segregation in fcc binary alloys, *T. Hashimoto, Y. Isobe and N. Shigenaka* 108
Quantification of defect–solute coupling from inverse-Kirkendall segregation, *E.P. Simonen, L.A. Charlot and S.M. Bruemmer* 117
Microstructure of copper and nickel irradiated with fission neutrons near 230°C, *S.J. Zinkle and L.L. Snead* 123
Low activation braze joint of dispersion-strengthened copper, *S. Chen and B.A. Chin* 132
Microstructure and tensile properties of neutron irradiated Cu and Cu–5Ni containing isotopically controlled boron, *T. Muroga, H. Watanabe, N. Yoshida, H. Kurishita and M.L. Hamilton* 137
Microstructure investigation of Cr and Cr alloys irradiated with heavy ions, *V.V. Bryk, V.N. Voyevodin, I.M. Neklyudov and A.N. Rakitskij* 146
Swelling and dislocation evolution in simple ferritic alloys irradiated to high fluence in FFTF/MOTA, *Y. Katoh, A. Kohyama and D.S. Gelles* 154
Void swelling in binary Fe–Cr alloys at 200 dpa, *D.S. Gelles* 163
Microstructure–mechanical properties correlation of irradiated conventional and reduced-activation martensitic steels, *R.L. Klueh, J.-J. Kai and D.J. Alexander* 175
Hardness of 12Cr–8Mo ferritic steels irradiated by Ni ions, *J. Ohta, T. Ohmura, K. Kako, M. Tokiwai and T. Suzuki* 187
Experimental evidence of several contributions to the radiation damage in ferritic alloys, *M. Akamatsu, J.C. Van Duysen, P. Pareige and P. Auger* 192
Irradiation-induced microstructural changes, and hardening mechanisms, in model PWR reactor pressure vessel steels, *J.T. Buswell, W.J. Phythian, R.J. McElroy, S. Dumbill, P.H.N. Ray, J. Mace and R.N. Sinclair* 196
Characterization of phosphorus segregation in neutron-irradiated Russian pressure vessel steel weld, *M.K. Miller, R. Jayaram and K.F. Russell* 215
APFIM investigation of clustering in neutron-irradiated Fe–Cu alloys and pressure vessel steels, *P. Auger, P. Pareige, M. Akamatsu and D. Blavette* . . . 225
Effect of specimen size on the impact properties of neutron irradiated A533B steel, *L.E. Schubert, A.S. Kumar, S.T. Rosinski and M.L. Hamilton* 231
Size effects on the upper shelf energy of a neutron irradiated pressure vessel weld metal, *A.S. Kumar, L.E. Schubert, M.L. Hamilton and N.S. Cannon* . . . 238
Microstructural aspects of accelerated deformation of Zircaloy nuclear reactor components during service, *M. Griffiths, R.A. Holt and A. Rogerson* 245
Tensile behavior and microstructure of neutron-irradiated Mo–5% Re alloy, *A. Hasegawa, K. Abe, M. Satou and C. Namba* 259
Change in physical properties of high density isotropic graphites irradiated in the "JOYO" fast reactor, *T. Maruyama, T. Kaito, S. Onose and I. Shibahara* . . . 267
Radiation damage of graphite and carbon–graphite materials, *Ya.I. Shtrombakh, B.A. Gurovich, P.A. Platonov and V.M. Alekseev* 273
Inert gas release from metals and UO_2 during high temperature annealing: the role of thermal vacancies, *J.H. Evans* 302
A mechanistic model for radiation-induced crystallization and amorphization in U_3Si, *J. Rest* 308
Effect of irradiation on the microhardness of the LEC grown semi-insulating GaAs single crystals, *M. Udhayasankar, S. Arulkumaran, J. Arokiaraj, P. Santhanaraghavan, B. Sundarakannan, J. Kumar, P. Ramasamy, K.G.M. Nair, P. Magudapathy, N.S. Thampi and K. Krishan* 314
Structural damage in spinel after ion irradiation, *N. Bordes, K.E. Sickafus, E.A. Cooper and R.C. Ewing* . 318
Optical properties in fibers during irradiation in a fission reactor, *T. Shikama, T. Kakuta, M. Narui, T. Sagawa and H. Kayano* 324
Radiation induced conductivity in alumina, *C. Patuwathavithane, W.Y. Wu and R.H. Zee* 328

Author index 337
Subject index 340